

Site Visit Report

Under the European Union (Drinking Water) Regulations 2014 as amended, the Environmental Protection Agency is the supervisory authority in relation to Irish Water and its role in the provision of public water supplies. This Audit was carried out to assess the performance of Irish Water in providing clean and wholesome water to the visited public supply.

The audit process is a sample on a given date of the facility's operation. Where a finding against a particular issue has been reported this should not be construed to mean that this issue is fully addressed.

Water Supply Zone	
Name of Installation	Macroom
Organisation	Irish Water
Scheme Code	0500PUB2307
County	Cork
Site Visit Reference No.	SV26202

Report Detail	
Issue Date	12/12/2022
Prepared By	Criona Doyle

Site Visit Detail			
Date Of Inspection	02/12/2022	Announced	Yes
Time In	10:25	Time Out	11:54
EPA Inspector(s)	Criona Doyle		
Additional Visitors			
Company Personnel	Irish Water: Tommy Roche, Claire Hurley, Cormac Bergin. Cork County Council (acting under service level agreement to Irish Water): Mary Hickey, Ray O'Connell, Pauline McAree, Jerry Creedon.		

> Summary of Key Findings

1. A Boil Water Notice (BWN) was placed on the Macroom Public Water Supply (PWS) on 13/11/2022 due to the inability of the plant to treat the raw water effectively following heavy rain. The Boil Water Notice (BWN) remained in place on the day of the audit. A programme of enhanced filter backwashing is taking place to improve the performance of the filtration stage of the DAFF (Dissolved Air Flotation Filtration) to bring the treated water turbidity levels back within the normal operating range following blinding of the filters.
2. An upgrade of the filtration stage is proposed by Irish Water. The works are currently at design stage and no details of the timeframe for the completion of the upgrade works were provided at the audit.
3. In the absence of appropriate turbidity alarm setpoints it is not possible to verify that the *Cryptosporidium* barrier is being maintained at all times. Alarms set points and inhibits are required in accordance with the log turbidity performance criteria as set out in the *EPA Water Treatment Manual: Filtration* to verify the *Cryptosporidium* barrier. The EPA will consider adding this supply to the Remedial Action List in 2023.

> Introduction

The Macroom Public Water Supply serves a population of 4,237 and produces on average 1,500m³/d of treated water. Raw water is abstracted from the Sullane River. Treatment includes coagulation, flocculation, clarification, disinfection and fluoridation. Clarification is undertaken in 2 no. dissolved air flotation chambers which have in built rapid gravity filters (DAFF).

The audit was undertaken at the Macroom Water Treatment Plant (WTP) to assess the operation and management of the water treatment plant following the placing of a Boil Water Notice (BWN) on the PWS on the 13/11/22. At the time of the issue of this audit report the BWN remains in place.

> Supply Zones Areas Inspected

The audit focused on the Irish Water response to the turbidity incident which resulted in the placing of a boil water notice on the public water supply on 13/11/22. Progress with the implementation of the audit recommendations since the previous audit (18/11/2021) was also reviewed.



1. Incident Management

1.1

	Answer
Was the incident suitably alerted to the plant operators, escalated and managed in order to maintain water quality and protect public health?	Yes
<p>Comment</p> <p>Incident: On the night of 12/11/22 to 13/11/22 the Macrooom WTP automatically shut down in response to the high turbidity alarm (0.8 NTU) on the final water following heavy rainfall in the preceeding days. The WTP remained shutdown overnight. To restart the WTP both DAFF filters had to be backwashed. By the morning of the 13/11/22 the reservoir levels had dropped to a critically low level due to a combination of the WTP shutdown, a large leak on the distribution network and the additional backwashing of the filters.</p> <p>The automatic plant shutdown prevented the discharge of potentially inadequately treated water to the network overnight on 12/11/22 to 13/11/22. Irish Water and Cork County Council consulted with the HSE on 13/11/22. To ensure continuity of supply to customers the treated water was brought back into supply on 13/11/22 under the protection of a BWN.</p> <p>Irish Water notified the EPA of the placing of the BWN on the supply on 14/11/22. The criteria agreed with the HSE for the lifting of the BWN are (i) water treatment plant operating satisfactorily (ii) receipt of compliant monitoring results from WTP and the network for 3 no. consecutive days. On the day of the audit the BWN remained in place.</p> <p>Remedial works: Cork County Council outlined that a programme of enhanced filter backwashing was taking place at the WTP. Backwashing of both filters has been taking place twice per day to resolve the blinding of the filters which occurred due to a reduced backwashing frequency from 13/11/22 to 23/11/22.</p> <p>Irish Water confirmed upgrading of the existing filtration stage is planned to address the protozoal treatment requirement log deficit. It is expected the design will be completed by Q2 2023 following which an estimated timeframe for completion will be available. Further upgrades to the current PLC are not possible to allow the addition of turbidity alarms and inhibits to the PLC.</p>	



2. Filtration

2.1

	Answer
Does monitoring indicate that the filters are operating effectively?	No
Comment	
<p>On the day of the audit the automatic plant shutdown linked to the turbidity inhibit setpoint of 0.8 NTU remained disabled as the WTP continues to operate under a BWN while the filtered water turbidity remains elevated (Filter 1 0.636 NTU, Filter 2 0.672 NTU and combined final filtered water 0.9195 NTU). On the day of the audit the WTP was not meeting the turbidity limits to qualify for log credit removal.</p> <p>Irish Water stated options for the replacement of the DAFF with DAF and separate filters are being examined as part of planned filter upgrade works. It is expected the design will be completed by Q2 2023 following which an estimated timeframe for completion of the works will be available. Further upgrades to the current PLC are not possible to allow the addition of turbidity alarms and inhibits to the PLC for each of the DAFF units.</p>	



3. Disinfection

		Answer
3.1	Does the trend in chlorine residual at the treatment plant indicate adequate and stable levels of disinfection?	Yes
Comment		
<p>The residual chlorine trend indicates stable levels when water is being pumped through the rising main.</p> <p>The residual chlorine trend is seen to dip when water is not being pumped through the rising main. The residual chlorine monitor is located on the rising main to the reservoir. This issue is to be addressed by the current disinfection programme works which includes the installation of residual chlorine monitors on the outlet from the reservoir. All of the observed dips on the chlorine trend related to periods when water was not being pumped through the rising main.</p>		

		Answer
3.2	Is the residual chlorine monitored at a suitable sample location after contact time has been completed?	No
Comment		
<p>The Disinfection Programme upgrade works were observed to be progressing at the WTP and are due for completion by end of 2022. Process proving and site acceptance testing is due to take place in Q1 2023. The installation of an appropriate alarm set point on the outlet from the reservoir to verify that contact time is being maintained at all times is to be undertaken under the disinfection programme upgrades.</p>		



4. Treatment Process Chemicals

	Answer
4.1 Are treatment process chemicals appropriately managed and stored?	No
Comment	
<p>On the day of the audit a temporary IBC was being used for storage of sodium hypochlorite for chlorination. Two new bulk storage tanks have been installed on site but were not in use on the day of the audit as the disinfection upgrades have not been commissioned.</p> <p>A build up of liquid was observed in the bund of the sodium hypochlorite day tank.</p>	



5. Management and Control

		Answer
5.1	Is the plant suitably managed and controlled to maintain the designed log credit on each treatment stage?	No
Comment		
<p>Irish Water confirmed that the protozoal log treatment requirement has been confirmed as 3.5 log requirement following the completion of the sanitary survey.</p> <p>At present there are no turbidity alarm set points on the individual filters (DAFF No.1 and DAFF No. 2). In addition the turbidity alarm set point of 0.8 NTU on the combined final filtered water does not meet the 0.3 NTU limit specified in the <i>EPA Water Treatment Manual: Filtration</i>.</p> <p>Irish Water outlined that the log deficit will be addressed by the filter upgrade works. Weekly monitoring for <i>Cryptosporidium</i> is currently taking place in response to the ongoing issues with elevated turbidity at the WTP. Following the return of the WTP to normal operating conditions the <i>Cryptosporidium</i> monitoring frequency is to revert to monthly in accordance with the <i>Irish Water Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Supplies</i> until the log deficit is addressed. <i>Giardia</i> was reported in a sample dated 14/06/22 (0.001 / 10 L). There have been no further detections of <i>Giardia</i> or <i>Cryptosporidium</i>.</p>		
		Answer
5.2	Are suitable alarm settings in place to alert operators to deteriorating water quality and/or the failure of a critical treatment process?	No
Comment		
<p>On day of the audit the automatic plant shutdown linked to the turbidity inhibit setpoint of 0.8 NTU remained disabled as the WTP continues to operate under a BWN while the filtered water turbidity remains elevated. The turbidity alarm set points do not meet the guidance for log removal credits therefore the protozoal barrier cannot be verified until the appropriate alarms and inhibits are in place.</p> <p>As part of the audit the turbidity trend data for the week proceeding the incident was examined and indicated elevated turbidity on 10/11/22 and 11/11/22. A final filtered water turbidity of up to 2 NTU is shown on the trend. Cork County Council stated the turbidity trend data over this time period had been affected by dirt on the turbidity monitors and that cleaning of the monitors for Filter 1, Filter 2 and the final water had resolved the issue.</p> <p>Details of the alarm logs for the 10/11/22 and 11/11/22 were not available at the audit to confirm if the final water turbidity alarm had been generated or automatic plant shutdown initiated in response to the inhibit level (0.8 NTU) being exceeded. Based on the information available at the audit it was not clear if the automatic plant shutdown was correctly operating on 10/11/22 and 11/11/22.</p>		
		Answer
5.3	Have the recommendations from the previous EPA audit been satisfactorily addressed?	No
Comment		

The following audit recommendations from the previous audit undertaken on 26/11/2021 have yet to be addressed: (i) installation of turbidity alarms and inhibits in accordance with the log turbidity performance criteria as set out in the *EPA Water Treatment Manual: Filtration* (ii) install a run to waste after backwashing (iii) installation of automatic plant shutdown linked to the high chlorine alarm (iv) installation of appropriate alarm set point on the outlet from the reservoir to verify that contact time is being maintained at all times.

Recommendations

Subject	Macroom Audit 02 12 2022	Due Date	12/01/2023
Action Text	<p>Recommendations</p> <p>Irish Water is responsible for ensuring a safe and secure supply of drinking water. To address these issues Irish Water should implement the following recommendations without delay.</p> <ol style="list-style-type: none"> 1. Irish Water should inform the EPA of any changes to the HSE advice. 2. Irish Water should provide details of (i) the alarms generated between 09/11/22 and 13/11/22 and (ii) review the turbidity trend data for the same period to confirm the automatic plant shutdown linked to the turbidity inhibit set point is correctly operating. 3. Irish Water should complete the disinfection programme upgrade works. 4. Irish Water should progress the proposed upgrade works to the filtration system and confirm the estimated completion date. 5. Irish Water should progress the following outstanding audit recommendations from the 2021 audit: (i) installation of turbidity alarms and inhibits in accordance with the log turbidity performance criteria as set out in the EPA Water Treatment Manual: Filtration (ii) install a run to waste after backwashing (iii) installation of automatic plant shutdown linked to the high chlorine alarm (iv) installation of appropriate alarm set point on the outlet from the reservoir to verify that contact time is being maintained at all times. 6. Irish Water should ensure <i>Cryptosporidium</i> monitoring is undertaken as per the <i>Irish Water Rationale for Determining the Frequency of Cryptosporidium Monitoring in Public Supplies</i> until the protozoal log treatment deficit is addressed. 7. Irish Water should remove the liquid from the bund on the chlorine day tank. <p>Follow-Up Actions required by Irish Water</p> <p>During the audit, Irish Water representatives were advised of the audit findings and that action must be taken as a priority by Irish Water to address the issues raised.</p> <p>This report has been reviewed and approved by Regina Campbell, Drinking Water Team Leader.</p> <p>Irish Water should submit a report to the Agency on or before 12/01/2023 detailing how it has dealt with the issues of concern identified during this audit.</p> <p>The report should include details on the action taken and planned to address the various recommendations, including time frame for commencement and completion of any planned work.</p> <p>The EPA also advises that the findings and recommendations from this audit report should, where relevant, be addressed at all other treatment plants operated and managed by Irish Water.</p> <p>Please quote Compliance Plan DW20210046 in any future correspondence in relation to this Report.</p>		